



## **Influence Of Polythene Bag Alternatives On Compliance To Environmental Legislation On Polythene Bag Ban In Rongai Sub-County, Nakuru County, Kenya**

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### **Abstract**

Polythene bags have been preferred for packaging purposes because they are light in weight, cheap and resistant to degradation. Despite the benefits, poor disposal of polythene causes degradation and pollution of soil, water, land and air resources leading to health problems and Climate change. Furthermore, polythene kills the wild game, livestock and aquatic organisms. These problems led to the introduction of legislation in 2017 banning polythene bags of less than 30 microns. Reports of availability of these polythene bags and emergence of poor quality alternatives in Kenya indicate lack of compliance to this environmental Legislation. Therefore, the objective of this study was to determine the influence of polythene bags alternatives on the extent of compliance to environmental legislation on polythene bag ban in Rongai sub-county, Nakuru County, Kenya and to recommend possible solutions. The descriptive research design was used in the study. A sample size of 259 respondents was selected using proportionate stratified random sampling from a target population of 18,377 households and 580 traders and purposively selected 6 Key informants. Instruments used included Piloted questionnaires (0.74 Cronbach's alpha level), focus group discussions Observation and photography. Data analysis was done using SPSS version 20. Percentages were used in descriptive statistic while Chi-square at 5% level of significance ( $\alpha=0.05$ ) was used in the inferential statistic. Results indicated that 50% of respondents use propylene bags which was attributed to the lack of alternatives by the majority significantly agreeing ( $p<.0001$ ). This study is important in the reforms of Environmental policy, promotion of awareness and compliance of this legislation in Kenya.

**Keywords:** Compliance, Polythene bag, Environmental Legislation

### **1. Introduction**

Polythene bags have been used for a very long time as packaging and carrier bags because they are cheap, light and resistant to degradation (Kakoti, 2017). Despite the benefits, poor disposal of polythene has led to pollution-causing degradation of soil, water, land and air resources leading



to health problems such as respiratory infections. An estimated 79% of the plastic waste ever produced lie in dumpsites, landfills or scattered in the environment (UNEP, 2018b). This packaging polythene is meant for single-use and accounted for 47% of total waste generated across the world in 2015 and has presented a great challenge in solid waste management leading to environmental health hazards and economic loses (UNEP, 2018a). Polythene was identified as a major Environmental problem and European Union directives (EU) 2015/720 compelled nations to reduce consumption of lightweight polythene which leads European member states in adopting several measures including legislative, fee, tax and voluntary measures to address the environmental problems associated with polythene (EU, 2015). Poor disposal of polythene bags in Kenya has led to solid waste management challenges, flooding of roads due to clogging of drainage systems, the spread of water-borne such as cholera and Malaria since they create habitats for vectors (Peppia, 2016). Livestock, wildlife, and aquatic organism lives are being threatened by polythene when they ingest, some have been strangled, entangled and smothered (Kühn, Rebolledo, & van Franeker, 2015). Kenya banned the use of polythene bags in the country through Gazette notice No. 2536 of August 2017, but challenges of compliance are indicated by reports of the availability of polythene bags in the community although there was a subsequent ban of propylene bags by Gazette notice No. 2334. This research, therefore, was to find out the extent to which polythene bags alternatives influence compliance to the environmental legislations and give recommendation and possible solutions to improve compliance.

## **2. The problem**

The Government of Kenya through gazette notice No. 2334 of 2017 and 2536 of 2019 banned the manufacture, distribution, and use of single-use polythene bags (RoK, 2017). This was an attempt mainly to avert the environmental, health and economic challenges posed by polythene bags. However, those used for industrial primary packaging at the source of the product were exempted from the ban. The legislations objectives and success is compromised as indicated by the subsequent ban of polypropylene in the country and reports of the availability of the polythene bags in Rongai Sub-County (Murathe, 2017). The reasons for this non-compliance to the Environmental legislation were not known, however, literature has information linking to the lack of alternative products to polythene bags among others (Mitchell, 2007). Therefore, because no research had been done in Rongai Sub-county to explain the reasons for non-compliance, this study attempted to investigate the extent to which polythene bags alternatives influence compliance to the environmental legislation in Rongai Sub-County.

## **3. Objectives**

The key objective of this research study is to improve on the compliance levels of the environmental legislation meant to eradicate polythene bags and its negative impact leading to fewer risks and better health, improved environmental aesthetics, reduced Carbon dioxide levels caused by burning of polythene bags responsible for climate change and finally reduction of solid wastes in Kenya. The specific objectives were;



1. To determine the influence of polythene bags alternatives on the extent of compliance to environmental legislation on polythene bag ban in Rongai sub-county, Nakuru County, Kenya.
2. To make recommendations and possible solutions to improve compliance on the environmental legislation on polythene bag ban.

#### **4. Literature review**

##### **4.1 Partnership, research, and development of alternative carrier products**

In the year 2004, Luxembourg came up with an initiative called Eco-sac project, it brought together the Ministry of Environment, trade confederations and non-profit organization in an attempt to find an eco-friendly alternative to polythene bags. This project led to the adoption of a re-usable bag named "Okot-Tut" that saw 85% drop in the use of polythene after 9 years (UNEP, 2018). This is a demonstration that the success of polythene bag ban in any country is dependent on initiatives of coming up with alternatives to replace the non-biodegradable polythene. In Kenya, the ban was introduced without any form of arrangement and collaboration for the development of polythene bag alternatives

##### **4.2 Promotion of alternatives**

The partial ban was implemented in France in 2016 and is aimed at eradicating non-biodegradable and thin polythene bags and to promote the manufacture of biodegradable polythene bags. This partial ban was designed to maintain the economy without affecting the environment adversely and promoting the bio-based industries due to their economic potentials it presents (Peppia, 2016). Rwanda was the first country to ban polythene bags in 2008; the country faced noncompliance because of lack of recommended materials and this led to illegal introduction of polythene through black market, to control and stop the smuggling of polythene, Rwanda Government invested in promoting the alternatives coupled with strict enforcement in the country and this led to improved compliance to the polythene ban (Danielsson, 2017). This implies that promotion of good quality alternatives is key in boosting compliance on polythene management legislations.

##### **4.3 Incentives**

In countries that opted to ban polythene bags, the majority have realized that adoption of alternative non-biodegradable bags through the promotion of the alternatives bags was through incentives which led to improved compliance (Synthia & Kabir, 2014). Incentives were meant to encourage investments in eco-friendly carrier bags that are affordable and durable which will result in eradication of polythene bags (UNEP, 2018b). In Kenya, the alternative materials that were recommended and approved by Kenya bureau of standards for use in the production of carrier bags are canvas, cloth and polypropylene materials (Wangui, 2017). However, this led to the introduction of poor quality polypropylene in the market leading to a further notice banning its manufacture and distribution through legal Gazette notice 2334 of March 2019. The Government of Kenya did not put effort and emphasis especially through incentives to promote environmental friendly carrier bags alternatives in the county.



## 5. Methodology

The study employed descriptive research survey design, which portrays an accurate profile of the influence of alternatives on the polythene bag ban in Rongai Sub-county (Sekeran & Bougie, 2009). The study targeted a population of 147,017 people (18,377 households) and 580 traders from the five administrative units of Rongai; Mosop, Visoi, Soin, Menengai West and Solai (KNBS, 2015). The sample size was determined using Nassiuma 2000 (Nassiuma, 2000) formula obtained respondents as follows; 143 households and 116 traders. A stratified sampling allocation proportional to strata size was adopted. The study utilized secondary sources of data and primary sources that were randomly collected in each stratum using piloted questionnaires (Cronbach's Alpha level 0.74), Key Informants interviews of Nakuru County NEMA compliance officer, five (5) Chiefs from the respective wards and 5 focused groups discussion of 5-10 individuals was held in each of the wards including observation and oblique photography. The study involved a total of 265 respondents. The data was analyzed using SPSS version 20. Descriptive statistics involved percentages and Chi-Square was used in inferential statistics.

## 6. Results

### 6.1 Demographic Characteristics

The response rate of questionnaires was 95 percent and this was made up of 115 (47 percent) female and 130 (53 percent) male. Majority of the respondents were youth between the ages of 18-35 in both genders, male in this age bracket were 37% and female 33%. The results also indicated that the majority (46%) of the respondents have a Kenya Certificate of Secondary Education certificate as their highest level while 37% had a college Diploma and above. Almost 50% of the total respondents had an income of less than ten thousand shillings a month while 33% had an income between Ksh 10,000 and 20,000.

### 6.2 Carrier bags Alternatives and its economics

The study was aimed at determining the extent to which polythene bag alternatives influences compliance to Polythene bag ban legislation in Rongai Sub-County. The following results were obtained.

Table 1: Carrier bags alternatives and its economics

	SD	D	UN	A	SA	$\chi^2$	P>
Familiarity with alternative materials for carrier bags	3.27	7.76	11.43	46.94	30.61	164	<.001
Informed well on recommended alternatives to polythene bags	6.12	10.61	9.8	47.35	26.12	143	<.001
Cost of alternative bags is cheaper to the cost of polythene bags	30.61	46.53	7.35	8.16	7.35	156	<.001
Cost of the polythene bag is cheaper than alternative bags	6.56	6.15	8.2	43.03	36.07	159	<.001
Materials for making eco-friendly bags are easily available.	14.69	21.22	25.31	27.35	11.43	22.7	<.001



Alternative carrier bags are made in Rongai sub-county                      24.9    28.16    27.35    12.65    6.94    45.2    <

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**KEY:** SD-Strongly Disagree, D-Disagree, UN-Unaware, A-Agree, SA-Strongly agree

Findings displayed in the table above indicate that majority of the residents (46.94%) responded significantly ( $\chi^2=164$ ;  $P<.001$ ) that are acquainted with at least some of the alternative carrier bag materials used. This was contrary to 47.35 % of the respondents who agreed significantly ( $\chi^2=143$ ;  $P<.001$ ) that they have not been informed adequately on the types of recommended alternatives carrier bags despite having been identified (Wangui, 2017). The success of polythene ban in Rwanda was dependent on the sharing of information and knowledge on the available resources that can be used for alternative bags (Danielsson, 2017)

When asked whether the cost for alternative materials is cheap, 46.53% of the respondents agree that it was not cheap ( $\chi^2=156$ ;  $P<.001$ ). This information was supported by a confirmation that the hindrance to the adoption of polythene bag legislation was due to expensive alternatives at 43.03% compared to polythene bags. Luxembourg was successful in eradication of polythene bag ban because of an initiative Eco-Sac project named "Okot-Tut" that came up with a cheap alternative that was affordable and durable (UNEP, 2018b). During the interviews and focus group discussions, it was identified that the resources for making eco-friendly carrier bags were available but the finances and skills were lacking, hence the need for collaborations and partnership.

Respondents totaling above 60 percent significantly agreed ( $\chi^2=22.7$ ;  $P<.001$ ) that the materials for making alternative carrier bags are not easily available in Rongai Sub-County This is contrary to focus group discussions, interviews and observation that Sisal, Bananas, and reeds were found within the Rongai Sub-County, this was an indicator of gaps in their knowledge on alternative materials. It was also clear that compliance to polythene bag ban legislation was slow because 24.9 percent strongly disagreed while (28.16 percent disagree that materials for making eco-friendly carrier bags are found in Rongai while 27.35 percent were unaware. 122 (50 percent) of the respondents accepted that they are using the propylene bags and confirmed that they are of poor quality. The challenges faced identified were that the alternatives were expensive, not durable and cannot be used for packaging products such as meat as well as not waterproof. This was an indication that little is being done in production and promotion of good quality alternatives carrier bags.

## **7. Recommendations and areas for further study**

**The recommendations and areas of further study are as follows**



1. There is a need for raising public awareness on the alternative materials for carrier bags and explaining the importance of environmental legislation and the details of the consequences it attracts.
2. Promotion of alternatives: Should be done by assessment of the availability of alternative materials and documented and this information shared with the public to encourage utilization in manufacturing eco-friendly carrier bags.
3. The government should provide financial incentives to support groups and industries that are involved in the manufacture of cheaper eco-friendly products. This will help change the habits of consumers, retailers, and manufacturers
4. Partnerships and collaborations should be promoted where research, development, and innovation of ideas on eco-friendly products are nurtured and actualized in the country

## 8. Conclusion

The success of the Environmental Legislation in Kenya is dependent on the uptake of the eco-friendly alternatives. The government and its agencies need put in place clear plans on ways to promote and encourage production and consumption of environmental friendly carrier bags and support research, innovation and development of alternatives eco-friendly carrier products in the country.

## References

- Danielsson, M. (2017). The Plastic Bag Ban in Rwanda: Local Procedures and Successful Outcomes. Masters Thesis, Uppsala University, Rwanda.
- EU. (2015). Directive (EU) 2015/720 of the European Parliament and of the Council of 29 April 2015 amending Directive 94/62/EC as regards reducing the consumption of lightweight plastic carrier bags (Text with EEA relevance)—Publications Office of the EU. Retrieved May 27, 2019, from <https://publications.europa.eu/en/publication-detail/-/publication/58d93aee-f3bc-11e4-a3bf-01aa75ed71a1/language-en>
- Kakoti, R. (2017). Uses of plastic bags and environmental hazard-A study in Guwahati city. *IJAR*, 3(6), 1088–1094.
- KNBS. (2015). Economic Survey 2015. Retrieved May 27, 2019, from Kenya National Bureau of Statistics website: <https://www.knbs.or.ke/download/economic-survey-2015/>
- Kühn, S., Rebolledo, E. L. B., & van Franeker, J. A. (2015). Deleterious effects of litter on marine life. In *Marine anthropogenic litter* (pp. 75–116). Springer.
- Mitchell, R. (2007). *Compliance Theory, Compliance, Effectiveness, and Behaviour Change in International Environmental Law*. *Oxford Handbook of International Environmental Law*. Retrieved from <https://rmitchel.uoregon.edu/sites/rmitchell1.uoregon.edu/files/resume/chapters/1996-ComplianceTheory.pdf>



Murathe, E. (2017, October 11). 11 charged over plastic bags use. *Business Daily*. Retrieved from <https://www.businessdailyafrica.com/news/11-charged-over-possession-of-plastic-bags/539546-4135002-12dje20z/index.html>

Nassiuma, D. K. (2000). *Survey Sampling: Theory and Methods*. Nairobi, Kenya: Nairobi University Press.

Peppas, S. (2016). Thinking outside the plastic bag: How Greece can reduce the plastic bag consumption. *IIIEE Masters Thesis*.

RoK. (2017). *The Kenya Gazette 2334. The Environmental Management and Co-ordination Act, (Cap. 389)*. Retrieved from [https://www.nema.go.ke/images/Docs/Awarness%20Materials/Gazette\\_legal\\_Notice\\_on\\_carrier\\_bags.pdf](https://www.nema.go.ke/images/Docs/Awarness%20Materials/Gazette_legal_Notice_on_carrier_bags.pdf)

Sekeran, U., & Bougie, R. (2009). *Research Methods for Business: A Skill Building Approach* (5th ed.). Hoboken: John Wiley and Sons.

Synthia, I. J., & Kabir, S. (2014). *Ban On Plastic Bags And The Emergence Of New Varieties: A Study Of Awareness On Shopping Bags And The Possibility Of Behavior Change Towards Eco-Friendly Consumption. Proceedings of the Australian Academy of Business and Social Sciences Conference 2014 (in partnership with The Journal of Developing Areas)*. Retrieved from [https://www.aabss.org.au/system/files/published/AABSS2014\\_216.pdf](https://www.aabss.org.au/system/files/published/AABSS2014_216.pdf)

UNEP. (2018a). How smuggling threatens to undermine Kenya's plastic bag ban. Retrieved May 27, 2019, from UN Environment website: <http://www.unenvironment.org/news-and-stories/story/how-smuggling-threatens-undermine-kenyas-plastic-bag-ban>

UNEP. (2018b). Single-use plastics: A roadmap for sustainability | UN Environment. Retrieved May 27, 2019, from <https://www.unenvironment.org/resources/report/single-use-plastics-roadmap-sustainability>

Wangui, J. (2017). Kebs approves alternatives to plastic bags. Retrieved November 29, 2018, from Business Daily website: <https://www.businessdailyafrica.com/economy/Kebs-approves-materials-to-be-used-after-plastics-ban/3946234-3970050-kh631tz/index.html>